UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/501,110	12/02/2004	Shiroo Muraoka	61625 (70232)	1701

21874 7590 06/27/2008

EDWARDS ANGELL PALMER & DODGE LLP
P.O. BOX 55874
BOSTON, MA 02205

EXAMINER	
VENCI, DAVID J	

ART UNIT	PAPER NUMBER
1641	

MAIL DATE	DELIVERY MODE
06/27/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/501,110	MURAOKA ET AL.	
	Examiner	Art Unit	
	David J. Venci	1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *April 9, 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *04/09/08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Examiner acknowledges Applicants' reply filed December 17, 2007. Claim 1 is amended.

Claims 1-17 are pending and under examination.

Specification

The abstract is objected to because the abstract does not disclose that which is new in the art to which the invention pertains. Since this patent application is in the nature of an improvement to old processes or compositions, the abstract should include the technical disclosure of the improvement. See M.P.E.P. § 608.01(b). Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, step (2), the phrase "the water-sparingly-soluble/hardly extractable protein that is denatured previously" lacks antecedent basis and/or is indefinite. Whether "previously" falls outside the method, or whether the method requires performing one or more steps of "denaturing" a protein prior to step (2) is not clear. Assuming the latter, the term "denatured" is indefinite because the term "denatured" is a

relative term and the specification does not appear to define one or more standards for ascertaining “denatured”.

In claim 1, step (2), the phrase “the ionic surfactant used in step (1)” lacks antecedent basis and/or is indefinite because step (1) merely requires “extracting” and/or “solubilizing” the aqueous sample of protein and surfactant. Step (1) does not recite any step of "using" a surfactant.

In claim 1, step (2)(b), the phrase “the ionic surfactant” lacks antecedent basis and/or is indefinite. Whether claim 1, step (2)(b) requires diluting “the ionic surfactant” into the protein solution obtained in step (1), and/or whether step (1) requires producing a dilution of the protein solution with “the ionic surfactant” is not clear.

In claim 17, the phrase “the antibody according to any one of claims 12” is not clear.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4-7 and 11-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Knowles & Marchesi (US 4,658,022).

Knowles & Marchesi describe an immunoassay comprising:

(1) immunizing an animal against an immunogen comprising a protein solubilized with an aqueous ionic surfactant (see col. 9, lines 56-60, “immunizing a desired host animal with a suitably denatured form of a protein”; see *e.g.*, col. 8, line 15, “sodium dodecylsulfate”), and raising antibodies against the solubilized protein (see col. 9, lines 56-60, “examine the resulting immune response for antibodies exhibiting the desired increased specificity and/or avidity”; see *e.g.*, col. 3, lines 14-18, "somatic cell hybridization techniques to obtain antibodies");

(2) solubilizing a protein sample by adding the ionic surfactant of step (1) to the protein sample (see col. 10, lines 13-14, “treating the aqueous test sample involved to effectively denature a significant amount of any such protein"; see *e.g.*, col. 8, line 15, “sodium dodecylsulfate”);

(3) adding the antibodies raised in step (1) to the protein sample solubilized in step (2) (see col. 10, lines 16-17, “contacting the denatured sample with the antibody reagent”), wherein the final concentration of ionic surfactant is greater than 0.03% (w/v) (see col. 8, lines 38-41, "The extent of solubilization necessary will depend upon the properties of the protein analyte"; see *e.g.*,

sentence bridging cols. 8-9, "For guanidine[…] less than about 1.0 molar, with about 0.3 molar being particularly preferred", *i.e.*, 2.9-9.6% w/v guanidine, assuming mw = 95.53 g/mol, standard temperature and pressure).

(4) detecting antigen-antibody complexes in the diluted protein extract (see col. 10, lines 17-18, "determining binding of the antibody reagent to such protein").

With respect to claims 11, 12 and 17, Knowles & Marchesi describe assays for proteins found in buckwheat, wheat and peanuts (see col. 9, lines 16-20).

Claims 1, 4-7 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Caldwell & Schacter (US 4,427,782).

Caldwell & Schacter describe an immunoassay comprising:

(1) immunizing an animal against an immunogen comprising a protein solubilized and extracted with an aqueous ionic surfactant, and raising antibodies against the soluble extracted protein (see col. 4, lines 44-51, “Those fractions that contained only the MP39.5 [protein] were pooled and concentrated to a 1-2 ml volume by vacuum dialysis against[...] 0.1% sodium dodecyl sulfate. These concentrated preparations were used for[...] a source of immunogen for the preparation of antisera"; (paraphrasing mine); see *also*, paragraph bridging columns 6-7, “monospecific antibodies against MP39.5 antigen can be generated by suitable inoculation procedures with laboratory animals");

(2) extracting a protein sample with an aqueous solvent containing the ionic surfactant of step (1) to provide a protein solution (see col. 7, lines 52-56, “A specimen from the individual suspected of having Chlamydial infection is treated with detergent, *e.g.*, sodium dodecyl sulfate to extract the major outer membrane protein antigen”);

(3) adding the antibodies raised in step (1) to the protein solution (see col. 7, lines 57-63, “The extract from the specimen may then be mixed with a known quantity of radiolabeled or enzyme conjugated antibody against the MP39.5 antigen, previously secured from a laboratory animal source”) thereby forming an antigen-antibody complex (see col. 8, lines 1-6, “The ability of the clinical sample[...] to inhibit the ability of the radiolabeled or enzyme conjugated antibodies”) (paraphrasing mine);

(4) detecting antigen-antibody complexes without substantially diluting the solution (see col. 7, lines 64-66, “The radioactivity of the solid support system is measured; or color development in the enzyme conjugated system is measured”; see *specifically*, col. 8, lines 6-7, "Any demonstrated inhibition indicates the presence of *C. trachomatis* infection").

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2, 3 and 8-10 are rejected under 35 U.S.C. 103(a) as obvious over Knowles & Marchesi (US 4,658,022) in view of Powell, CURRENT PROTOCOLS IN MOLECULAR BIOLOGY, Unit 17.14A, John Wiley & Sons, Inc. (1995).

Knowles & Marchesi describe immunoassays as substantially described *supra*.

Knowles & Marchesi do not specify particular sodium dodecyl sulfate (SDS) concentrations and 2-mercaptoethanol concentration in the "aqueous solvent" (*i.e.*, claims 2, 3 and 8). Knowles & Marchesi do not teach a boiling step (*i.e.*, claims 9 and 10).

However, Powell describes methods for preparing glycoproteins for characterization (see p. 17.14.1, first and second sentences), including fine procedural details. Specifically, Powell describes an "aqueous solvent" having at least 0.3% SDS and 1M 2-mercaptoethanol (see ***BASIC PROTOCOL***, p. 17.14.2, *Materials*, "20% (w/v) sodium dodecyl sulfate (SDS)"; "1 M 2-mercaptoethanol (2-ME)"). In addition, Powell describes a boiling step lasting at least 5 minutes (see ***BASIC PROTOCOL***, p. 17.14.3, *Digest with protease*, Step 7, "Boil 10 min").

It would have been obvious to a person of ordinary skill to optimize Knowles' & Marchesi's method using Powell's particular sodium dodecyl sulfate (SDS) concentrations, 2-mercaptoethanol concentration, and

boiling step because Powell's steps remove "low-molecular-weight glycopeptides, degradation products, and sugar precursors", which Powell says is necessary prior to glycopeptide analysis (see *Critical Parameters and Troubleshooting*, p. 17.14.8., left column, item 1).

Claim 1 is rejected under 35 U.S.C. 103(a) as obvious over Youngner & Noll (US 2,981,658) in view of Salk, 49 J. IMMUNOL. 87 (1944).

Youngner & Noll describe an immunoassay comprising:

(1) solubilizing and extracting a protein sample by adding an aqueous ionic surfactant to the protein sample (see col. 4, lines 33-75, “lipid was put into suspension in virus containing solution, *e.g.*, the allantoic fluid from eggs, and then separated from the solution");

(2) immunizing an animal against an immunogen comprising the soluble extracted protein of step (1), and raising antibodies against the soluble extracted protein (see paragraph bridging columns 3-4, “The two grams of palmitic acid containing 110,000 hemagglutination units of adsorbed influenza virus were suspended to a volume of 20 cc. PBS. Chicks were immunized with two doses of suspension of 0.5 ml”);

(3) detecting antigen-antibody complexes (see paragraph bridging columns 3-4, “chicks produced mean antibody titers of greater than 1:300 when tested by the hemagglutination inhibition test”).

Youngner & Noll did not specify a hemagglutination inhibition test step of adding the antibodies raised in step (2) to the soluble extracted protein of step (1).

However, Salk describes a step of adding antibodies raised against viral proteins (see p. 87, first sentence, “corresponding antibody”; see *e.g.*, p. 92, last full paragraph, “post-vaccination serum") to a soluble extract of the viral proteins (see p. 87, first sentence, “virus hemagglutinin”; see *e.g.*, p. 92, last full paragraph, “To 0.5 ml of each serial dilution is then added 0.5 ml of the respective antigen") as part of a hemagglutination inhibition test for detecting antigen-antibody complexes (see paragraph bridging pp. 93-94, “complete neutralization or inhibition of the virus-effect”, “neutralize the hemagglutinin almost

completely"). In addition, Salk describes how to avoid "substantially diluting" the antigen solution by reducing the final concentration of red blood cells, which increases the agglutination titer (see Table 3).

It would have been obvious for persons of ordinary skill to include the specific steps of Salk's hemagglutination inhibition test with Youngner & Noll hemagglutination inhibition test because both Youngner & Noll and Salk are measuring antibody-hemagglutinin complexes, and Salk reiterates the relative "simplicity of performance" and "ease and rapidity" of Salk's endpoint determinations "without need for special equipment" (see p. 87, last paragraph).

Response to Arguments

Specification

In prior Office Action, Examiner objected to the Abstract for various reasons. In response, Applicants argue that their current Abstract conveys "the nature and gist of the technical disclosure" in accordance with 37 C.F.R. 1.72(b).

Applicants' argument is not persuasive. According to M.P.E.P. § 608.01(b), the "nature and gist" of Applicants' invention appears to encompass an improvement, *i.e.*, "that which is new in the art", of Applicants' invention. The current Abstract does not appear to convey such an improvement.

Prior Art Claim Rejections

In prior Office Action, claims 1, 4-7 and 11-17 were rejected under 35 U.S.C. 102(b) as being anticipated by Knowles & Marchesi (US 4,658,022). In addition, claims 2, 3 and 8-10 were rejected under 35 U.S.C. 103(a) as obvious over Knowles & Marchesi (US 4,658,022) in view of Powell, CURRENT PROTOCOLS IN MOLECULAR BIOLOGY, Unit 17.14A, John Wiley & Sons, Inc. (1995).

In response, Applicants argue that Knowles & Marchesi do not teach "raising the antibody by using the extracted and denatured protein as an immunogen" or "using the extracted protein as extracted and denatured to raise the antibody".

Applicants' argument is not persuasive. Knowles & Marchesi describe immunizing an animal against a denatured protein immunogen (see col. 9, lines 56-60, "immunizing a desired host animal with a suitably denatured form of a protein") for purposes of raising antibodies against the denatured protein (see col. 9, lines 56-60, "examine the resulting immune response for antibodies exhibiting the desired increased specificity and/or avidity"), and disclose a specific technique for raising antibodies (see *e.g.*, col. 3, lines 14-18, "somatic cell hybridization techniques to obtain antibodies").

Conclusion

No claims are allowable at this time.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David J. Venci whose telephone number is (571)272-2879. The examiner can normally be reached on 08:00 - 16:30 (EST). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

David J Venci
Assistant Examiner
Art Unit 1641

/Long V Le/
Supervisory Patent Examiner, Art Unit 1641